

Amendment and Response

Applicant: VanWinkle T. Townsend

Serial No.: 09/847,751

Filed: May 2, 2001

Docket No.: L250.109.101 (FE-00494)

Title: TELEMETRY SYSTEM AND METHOD FOR ACOUSTIC ARRAYS

REMARKS

This is responsive to the Non-Final Office Action mailed April 19, 2005. In that Office Action, the Examiner rejected claims 12, 16-18, 20, and 22-24 under 35 U.S.C. §102(a) as being anticipated by Lin et al. Claims 1 and 5-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson et al., U.S. Patent No. 4,628,493 (“Nelson”) and McArthur et al., U.S. Patent No. 5,272,476 (“McArthur”). Claims 2 and 3 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8 above, and further in view of Sonderegger et al., U.S. Patent No. 5,796,504 (“Sonderegger”). Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8 above, and further in view of Guy, U.S. Patent No. 6,690,886 (“Guy”). Claim 9 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claim 1 above, and further in view of Frigo, U.S. Patent No. 5,710,648 (“Frigo”). Claims 10 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8 above, and further in view of Green et al., U.S. Patent No. 6,516,939 (“Green”). Claims 13 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson. Claim 14 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Sonderegger. Claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Guy. Claims 19 and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Frigo.

With this Response, Applicant respectfully traverses the Examiner’s rejection of claims 1-25. Claims 1-25 remain pending in the application and are presented for reconsideration and allowance.

35 U.S.C. §102 Rejections

The Examiner rejected claims 12, 16-18, 20, and 22-24 under 35 U.S.C. §102(a) as being anticipated by Lin et al., Journal of Lightwave Technology publication (“Lin”). Independent claim 12 recites “a plurality of optical modulators, each optical modulator configured to receive one of the plurality of streams of optical pulses, each optical modulator configured to receive

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sensor information from at least one of the sensors, each optical modulator configured to modulate the received stream of optical pulses based on the received sensor information and thereby generate a modulated stream of optical pulses.” Similarly, independent claim 20 recites “receiving the plurality of streams of optical pulses with a plurality of optical modulators” and “modulating each of the received streams of optical pulses with the plurality of optical modulators based on sensor information generated by the array of sensors, and thereby generating a plurality of modulated streams of optical pulses.” The Examiner submits that Lin teaches on page 350, left column that each sensor is associated with a PZT phase modulator which is modulated based on sensor information. (Office Action, page 2).

Lin fails to teach or suggest optical modulators configured to receive one of the plurality of streams of optical pulses and modulating the received stream of optical pulses based on received sensor information. In contrast, Lin is merely disclosing an experimental setup in which a specific tested signal of 200 Hz, generated by a signal generator, is applied upon one of the sensor’s fiber arm through a PZT phase modulator to provide an effective phase signal of $3.4 \times 10^{-2} \text{ rad/(Hz)}^{1/2}$. A carrier signal of 20 kHz, generated by another signal generator, is applied upon one of the CI’s fiber arm through a PZT phase modulator to provide an optimum phase of 2.37 rad for PGC demodulation. The interference pulse trains are detected by the receiver and the sensing signal is demodulated by the PGC demodulator. (Page 350, left column). The PZT phase modulators disclosed by Lin are part of the test equipment for testing the disclosed system. Applicant disagrees with, and could find no support in Lin for the Examiner’s statement that “each sensor is associated with a PZT phase modulator which is modulated based on sensor information.” There is no teaching or suggestion in Lin that the disclosed system is configured to receive streams of optical pulses and modulate the received streams based on sensor information.

In view of the above, independent claims 12 and 20 are not taught or suggested by Lin. The applicant respectfully traverses the rejection of claims 12 and 20, and reconsideration and allowance of claims 12 and 20 is respectfully requested. Since dependent claims 16-18 further define patentably distinct claim 12, and claims 22-24 further define patentably distinct claim 20, and are further distinguishable over the cited prior art, these dependent claims are believed to be

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allowable over the cited references. Reconsideration and allowance of claims 16-18 and 22-24 is respectfully requested.

35 U.S.C. §103 Rejections

The Examiner rejected claims 1 and 5-8 under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson et al, U.S. Patent No. 4,628,493 (“Nelson”) and McArthur et al., U.S. Patent No. 5,272,476 (“McArthur”). Claim 1 recites “each subsystem in the first plurality of subsystems configured to modulate the first set of optical pulses based on the generated digital values and thereby generate a modulated optical pulse stream.” For the same reasons as discussed above with reference to claims 12 and 20, Lin fails to teach or suggest this claim limitation. Nelson and McArthur also fail to teach or suggest this limitation. In fact, it appears that the Examiner has failed to address this limitation.

In view of the above, independent claim 1 is not taught or suggested by Lin, Nelson, and McArthur, either alone, or in combination. The Applicant respectfully traverses the rejection of claim 1, and reconsideration and allowance of claim 1 is respectfully requested.

Claim 8 recites “wherein each subsystem in the first plurality of subsystems includes an optical modulator for modulating the first set of optical pulses based on the generated digital values.” The examiner submits that this limitation is taught by Lin at page 350, left column and that each sensor is associated with a PZT phase modulator which is modulated based on sensor information (Office Action, page 4). For the same reasons as discussed above with reference to claims 12 and 20, Lin fails to teach or suggest this claim limitation.

Since dependent claims 5-7 further define patentably distinct claim 1, and are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 5-7 is respectfully requested.

Claims 2 and 3 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur, as applied to claims 1 and 5-8, and further in view of Sonderegger et al., U.S. Patent No. 5,796,504 (“Sonderegger”). Since dependent claims 2 and 3 further define patentably distinct claim 1, and are further distinguishable over the cited prior art, these

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dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 2 and 3 is respectfully requested.

Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur, as applied to claims 1, and 5-8, and further in view of Guy, U.S. Patent No. 6,690,886 ("Guy"). Since dependent claim 4 further defines patentably distinct claim 1, and is further distinguishable over the cited prior art, this dependent claim is believed to be allowable over the cited references. Reconsideration and allowance of claim 4 is respectfully requested.

Claim 9 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claim 1 above, and further in view of Frigo, U.S. Patent No. 5,710,648 ("Frigo"). Claim 9 recites "wherein each optical modulator modulates the first set of optical pulses by passing and blocking optical pulses in the first set of optical pulses." With respect to claim 9, the Examiner stated that:

The difference between Lin et al., Nelson et al. and McArthur et al. and the claimed invention is that Lin et al., Nelson et al. and McArthur et al. do not teach a modulator that modulates by passing and blocking optical signals. Frigo teaches in FIG. 5B a modulator that blocks or passes optical signal. One of ordinary skill in the art would have been motivated to combine the teaching of Frigo with the modified telemetry system of Lin et al., Nelson et al. and McArthur et al. because the device of Frigo is simple and cost effective. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the optical blocking device of Frigo in the modified telemetry system of Lin et al., Nelson et al. and McArthur et al. because the device of Frigo is simple and cost effective. (Office Action, pages 6-7).

There is no suggestion to combine the cited references in the manner proposed by the Examiner. As pointed out above, the Examiner has acknowledged that Lin, Nelson, and McArthur do not teach a modulator that modulates by passing and blocking optical signals. Lin, Nelson, and McArthur do not include any teaching or suggestion that the systems disclosed therein could or should be modified to include modulators that block or pass an optical signal, nor do Lin, Nelson, and McArthur include any suggestion that it would be desirable to add modulators that pass and block an optical signal. Figure 5B of Frigo teaches an optical transducer wherein the sensor itself acts as a transducer reporting its status directly to a central office. The device is directly responsive to an external stimulus. An optical signal transmitted

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along the path of the device is normally passed through the device and directed upstream. However, when an external stimulus is present, the optical signal transmitted along the path is blocked or otherwise modified on its way upstream. The change in the optical signal can be detected at a remote monitoring station (See col. 6, lines 41-56). In contrast, claim 9, which further defines claim 1, recites an optical modulator for modulating the first set of optical pulses based on the generated digital values. The digital values are generated based on received analog signals generated by a plurality of acoustic sensors.

In view of the above, dependent claim 9 is not taught or suggested by Lin, Nelson, McArthur, and Frigo, either alone, or in combination. Since dependent claim 9 further limits patentably distinct claim 1, and is further distinguishable over the cited prior art, dependent claim 9 is believed to be allowable over the cited references. The Applicant respectfully traverses the rejection of claim 9, and reconsideration and allowance of claim 9 is respectfully requested.

Claims 10 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin, Nelson, and McArthur as applied to claims 1 and 5-8, and further in view of Green et al., U.S. Patent No. 6,516,939 ("Green"). Since dependent claims 10 and 11 further define patentably distinct claim 1, and are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 10 and 11 is respectfully requested.

Claims 13 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Nelson. Since dependent claim 13 further defines patentably distinct claim 12, and dependent claim 21 further defines patentably distinct claim 20, and these claims are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 13 and 21 is respectfully requested.

Claim 14 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Sonderegger. Since dependent claim 14 further defines patentably distinct claim 12, and is further distinguishable over the cited prior art, this dependent claim is believed to be allowable over the cited references. Reconsideration and allowance of claim 14 is respectfully requested.

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Claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Guy. Since claim 15 further defines patentably distinct claim 12, and is further distinguishable over the cited prior art, this dependent claim is believed to be allowable over the cited references. Reconsideration and allowance of claim 15 is respectfully requested.

Claims 19 and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lin in view of Frigo. Claim 19 depends from claim 12 and recites "wherein each optical modulator modulates the received stream of optical pulses by passing and blocking optical pulses in the received stream." Claim 25 depends from claim 20 and recites "wherein each of the received streams of optical pulses is modulated by passing and blocking optical pulses in the received streams." With respect to claims 19 and 25, the Examiner stated that:

The difference between Lin et al. and the claimed invention is that Lin et al. does not teach to modulate received optical pulses by passing and block optical pulses. Frigo teaches in FIG. 2 and FIG. 3 remote sensing system. Frigo further teaches in FIG. 5B an optical signal blocking device for blocking or passing an optical signal based on condition of a sensor. Frigo teaches in col. 7, lines 40-44 that such a system is applicable for detecting severe temperature condition such as a fire. One of ordinary skill in the art is motivated to combine the teaching of Frigo with the telemetry system of Lin et al. because for certain applications such as fire detection, a blocking/passing modulator is simple and provides reliable information. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a optical signal blocking device, as taught by Frigo, in the telemetry system of Lin et al. because for certain applications such as fire detection, a blocking/passing modulator is simple and provides reliable information. (Office Action, page 10).

As previously discussed with reference to claim 9, there is no suggestion to combine the cited references in the manner proposed by the Examiner. In addition, the proposed modification to Lin would also change the principle of operation disclosed in Lin, as well as require a substantial reconstruction and redesign of the system disclosed in Lin. The MPEP states that "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." MPEP §2143.01, citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). The MPEP also states that, in the *Ratti* case, "[t]he court reversed the rejection holding the 'suggested combination of references would require a

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substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.” MPEP §2143.01, citing *In re Ratti*, 270 F.2d at 813, 123 USPQ at 352.

In view of the above and since dependent claim 19 further defines patentably distinct claim 12, and dependent claim 25 further defines patentably distinct claim 20, and these claims are further distinguishable over the cited prior art, these dependent claims are believed to be allowable over the cited references. Reconsideration and allowance of claims 19 and 25 is respectfully requested.

CONCLUSION

In view of the above, Applicant respectfully submits that pending claims 1-25 are in form for allowance and are not taught or suggested by the cited references. Therefore, reconsideration and withdrawal of the rejections and allowance of claims 1-25 is respectfully requested.

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No fees are required under 37 C.F.R. 1.16(b)(c). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 50-0471.

The Examiner is invited to contact the Applicant's representative at the below-listed telephone numbers to facilitate prosecution of this application.

Any inquiry regarding this Amendment and Response should be directed to Jeff A. Holmen at Telephone No. (612) 573-0178, Facsimile No. (612) 573-2005. In addition, all correspondence should continue to be directed to the following address:

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Respectfully submitted,

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CERTIFICATE UNDER 37 C.F.R. 1.8:

The undersigned hereby certifies that this paper or papers, as described herein, are being deposited in the United States Postal Service, as first class mail, in an envelope address to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 19th day of July, 2005.

By Jeff A. Holmen
Name: Jeff A. Holmen